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physiographic contribution of so great possible interpretative value as "Block Mountains in New Zealand" be rendered almost useless to the student of earth history by the deliberate omission of all reference to geologic dates? Surely the incidental mention of the geologic age of the weak over-mass described by Cotton, and of any other events whose geologic dating may have been known, would not have impaired the geographic value of the paper.

By all means let us eliminate unnecessary and irrelevant geologic detail from geographic or physiographic descriptions, but let us not go to the extreme of rendering our geomorphologic studies valueless for their important interpretative functions.

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**REMOVING INSECTS FROM GREENHOUSE
PLANTS WITHOUT SPRAYING AND
WITHOUT INJURY TO THE
PLANTS**

WHEN one is running experiments in the greenhouse and the plants become infested with insects, the disposal of the pests becomes an important question. This question becomes all the more important if the nature of the investigation will not permit the plants to be sprayed. The writers were recently faced with such a problem and solved it by using an apparatus working on the principle of a vacuum cleaner.

A flask was fitted with connections similar to those of a wash bottle, the mouthpiece being connected with a suction pump by a piece of tubing sufficiently long to allow the flask to be moved to any point desired. The nozzle was extended to a point parallel with the bottom of the flask and the opening made sufficiently small to just allow the desired insects to pass readily. By putting a small amount of oil in the flask, for an insecticide, closing the connections and turning on the pump, the apparatus was ready for use. Small plants that were thickly covered with aphids and red spiders were quickly cleaned. Ants and other insects were also readily taken up. It is possible that this apparatus may be modi-

fied to meet many requirements by simply changing the size and shape of the nozzle, and by using various kinds of motors and pumps.

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SCIENTIFIC BOOKS

The Electron, Its Isolation and Measurement and the Determination of Some of Its Properties. By R. A. MILLIKAN. University of Chicago Press.

This volume of 260 pages contains an account of the work on the exact determination of the electronic charge and allied subjects done by Professor Millikan and his pupils during the last ten years. It also contains an account of the earlier researches which led up to Millikan's work, and besides a short discussion of recent views on the electron theory of matter and the theory of radiation to which Millikan's exact investigations have added precision in several important ways.

The book is intended for the general reader as well as for the physicist and it will be read by both with immense enjoyment and instruction. It is written clearly and concisely and is full of most interesting and important information.

The only criticism the writer of this review has to make is that the concluding chapters are too short; they contain so much that is interesting and suggestive that one can not help wishing the writer had found time to make them as full of detail as some of the earlier chapters.

Millikan's beautiful investigations on the electronic charge and on the photo-electric effect are justly celebrated throughout the scientific world; they will undoubtedly become classical examples of the highest type of modern physical research. A description of such researches by their author is immensely valuable and will serve to stimulate scientific investigation as nothing else can.

Every student of physics, and especially every graduate student, should obtain this book and study it thoroughly and then en-

deavor to imitate the author's infinite capacity for taking pains to overcome every difficulty and eliminate every source of error. By such work modern science is placed on a sure foundation, and besides new avenues of research are opened up. It is a mistake to suppose that investigations of high precision do not lead to new discoveries. Lord Rayleigh's exact measurements of the densities of the common gases resulted in the discovery of argon, and many similar examples could be given. It would be truer to say that *inexact* work often leads to discoveries being missed which ought to have been made and besides rough work generally leads to erroneous conclusions which others have to waste valuable time and energy setting right. Millikan, for example, has had to spend considerable time setting right the erroneous conclusions of Ehrenhaft on the existence of a "sub-electron," conclusions which ought never to have been drawn.

Millikan's new book is admirably printed and illustrated and seems very free from typographical errors. It is dedicated to Michelson and Ryerson and forms a record of work worthy of the inspiration of the former and the generosity of the latter. H. A. W.

MINERALS OF JAPAN

VALUABLE service has been rendered to mineralogy by Dr. Wada in his editorship of the "Beiträge zur Mineralogie von Japan," the articles in which, in spite of the German title, have been almost all in English. The latest issue¹ contains two articles on the minerals of Korea by Nobuyo Fukuchi, describing specimens of sixty different minerals (pp. 207-228). Other papers treat of prismatic sulphur from Formosa, by Masakichi Suzuki; the optical properties of danburite from Bungo Province, Japan, by Mikio Kawamura; epidote crystals from Iwaki Province, by Kinzō Nakashima; ferberite from Kai Province and hübnerite from Shimotsuke Province, by Kōtō Jūmbō. A paper of special interest is that on the aragonite cones formed at the

Kurujama Geysers, in Yuzawa, Shimotsuke Province, Japan. A cone 30 cm. in height was formed by the hot water of one of the geysers in a period of ten months.

In his work on "The Minerals of Japan," Dr. Tsunashirō Wada² gives in concise and systematic form characterizations of the various mineral forms that had been observed in Japan up to the date of his treatise. His thorough training in European methods added to his familiarity with the geology of his native land make this book a trustworthy source of information. The crystallographic details are quite fully given and constitute one of the most valuable features of the work for the mineralogical student.

As to the metals of Japan, Dr. Wada notes that the richest gold deposits are those on the island of Formosa (p. 12), the chief localities being Zucho Kinkwaseki near Taihoku, in the northeastern part of the island. Quartz veins traversing a volcanic rock are sometimes found bearing a large quantity of native gold. Frequently the yellow surface has a coating of limonite formed by the decomposition of pyrites. There are also alluvial gold deposits in Formosa. In Japan proper the rich placers in the Hokkaido are extensively worked; one crystal from the mining district of Esashi measured 6-10 mm. along the edges of its octahedron. The largest nugget was found in 1900 at the Usotannai in Esashi; it weighed 769.2 grams (2 pounds 15 2/3 dwts. Troy), the dimensions being 106 × 63 × 25 mm. (p. 13) and the intrinsic value about \$500. The oldest known gold mine in Japan is that of Sado.

As in many parts of the world, platinum is found in association with gold in Japan, for example in the Yubari-gawa and Pechan rivers in the Hokkaido, and it occurs with gold and iron sands in Nishi-Mikawa. Copper and silver are also met with in a number of localities, but crystallized silver has never been found in Japan.

Of the ornamental or gem stones the ame-

¹ "Beiträge zur Mineralogie von Japan," ed. by T. Wada, No. 5, November, Tōkyō, 1915 (pp. 207-305 of the series, one plate).

² Tsunashirō Wada, "Minerals of Japan," transl. by Takudzi Ogawa, Tōkyō, 1904, vii + 144 pp., 30 pls., 8vo.